SOFTSTEP simulations of stimulated Raman scattering in multidimensional inhomogeneous plasmas driven by structured laser beams

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The theory of stimulated Raman scattering in inhomogeneous and turbulent plasmas is investigated in the presence of laser beams with random phase plates. The growth rates and reflectivities of SRS at different densities and illumination conditions are calculated using a spectral technique to solve parabolic PDEs. The high frequency wave equations are not paraxialized but merely enveloped in time. SRS SOFTSTEP can examine multiple crossing pump waves, waves that reach their turning points, and filamenting pumps. This work at low densities sheds light on SRS issues concerning the NIF and at higher densities addresses high temperature hohlraums.

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